

TA-F120A/F220A

SERVICE MANUAL

*AEP Model
UK Model*



Photo: TA-F220A

SPECIFICATIONS

Amplifier

Continuous RMS power output (both channels driven simultaneously)

		TA-F120A	TA-F220A
DIN, 1 kHz	4 ohms	40W + 40W	70W + 70W
	8 ohms	40W + 40W	70W + 70W
20 Hz – 20 kHz THD 0.05%	8 ohms	30W + 30W	50W + 50W

Input

Input jack	Jack type	Sensitivity	Impedance	S/N (weighting network, input level)
PHONO (MM)	Phono	2.0 mV	50 kilohms	70 dB (A, 2 mV)
TUNER, CD, VIDEO/AUX, TAPE/DAT	Phono	150 mV	50 kilohms	100 dB (150 mV)

Output

Output jack	Jack type	Voltage/impedance
REC OUT	Phono jacks	Voltage 150 mV Impedance 1 kohms
SPEAKERS	—	Accepts speakers of 4 – 6 ohms/8 – 16 ohms.
HEAD-PHONES	Stereo phone jack	Accepts low and high impedance headphones.

Tone controls

	Response	Turnover frequency
BASS	±7 dB (100 Hz)	500 Hz
TREBLE	±8 dB (15 kHz)	3 kHz

Loudness (Attenuation 30 dB) (TA-F220A only)
+6 dB (100 Hz)
+3 dB (10 kHz)

— Continued on next page —



INTEGRATED STEREO AMPLIFIER
SONY®

TA-F120A/F220A

Harmonic distortion	Less than 0.05% at rated output
Intermodulation (IM) distortion (60 Hz:7 kHz = 4:1)	Less than 0.05% at rated output
Frequency response	PHONO: RIAA equalization curve ±0.5 dB TUNER, CD, VIDEO/AUX, TAPE1, TAPE2/DAT: 7 Hz – 100 kHz ±3 dB
Residual noise	Less than 170 µV (network A)
Damping factor	40 (8 ohms, 1 kHz)

General

System	Preamplifier: Low-noise, high-gain equalizer amplifier Power amplifier: Pure-complementary SEPP OCL power amplifier with all stages directly coupled
Power requirements	AEP model: 220V AC, 50Hz UK model: 240V AC, 50Hz
Power consumption	AEP model: TA-F120A: 95W TA-F220A: 150W UK model: TA-F120A: 230W TA-F220A: 380W
Dimensions	Approx. 430 × 135 × 315 mm (w/h/d) (17 × 5 3/8 × 12 1/2 inches)
Weight	AEP model: TA-F120A: Approx. 5.7 kg (12 lb 9 oz) TA-F220A: Approx. 7.4 kg (16 lb 5 oz) UK model: TA-F120A: Approx. 5.6 kg (12 lb 6 oz) TA-F220A: Approx. 6.8 kg (15 lb)

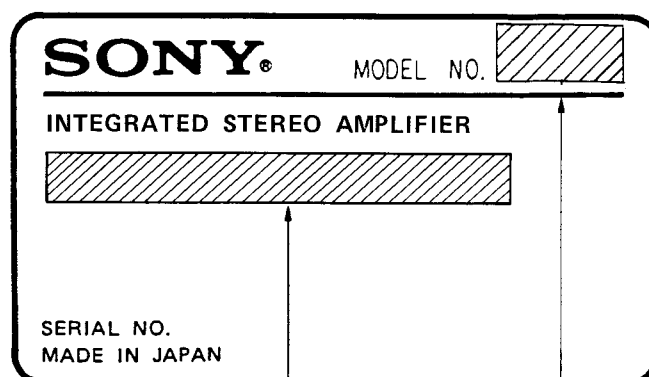
Design and specifications subject to change without notice.

Note

This appliance conforms with EEC directive 87/308/EEC regarding interference suppression.

MODEL IDENTIFICATION

— Specification Label —



TA-F120A
TA-F220A

AEP Model: AC: 220 V ~ 50/60 Hz
UK Model: AC: 240 V ~ 50/60 Hz

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
Specifications		1
Model Identification		2
SECTION 1. GENERAL		
1-1. Parts Identification		3
1-2. Connections		3
SECTION 2. BLOCK DIAGRAM		4
SECTION 3. ELECTRICAL ADJUSTMENTS ..		6
SECTION 4. DIAGRAMS		
4-1. Circuit Boards Location		6
4-2. Semiconductor Lead Layouts		6
4-3. IC Block Diagrams		6
4-4. Printed Wiring Boards		8
4-5. Schematic Diagram		13
SECTION 5. EXPLODED VIEWS		16
SECTION 6. ELECTRICAL PARTS LIST		18

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK OR DOTTED LINE WITH MARK ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

1-2. Connections

TA-F120A : TAPE/DAT MONITOR
Cassette deck/DAT deck
monitor switch

TA-F220A : LOUDNESS
Loudness switch

VOLUME
Volume control

SOURCE DIRECT
Source switch and indicator

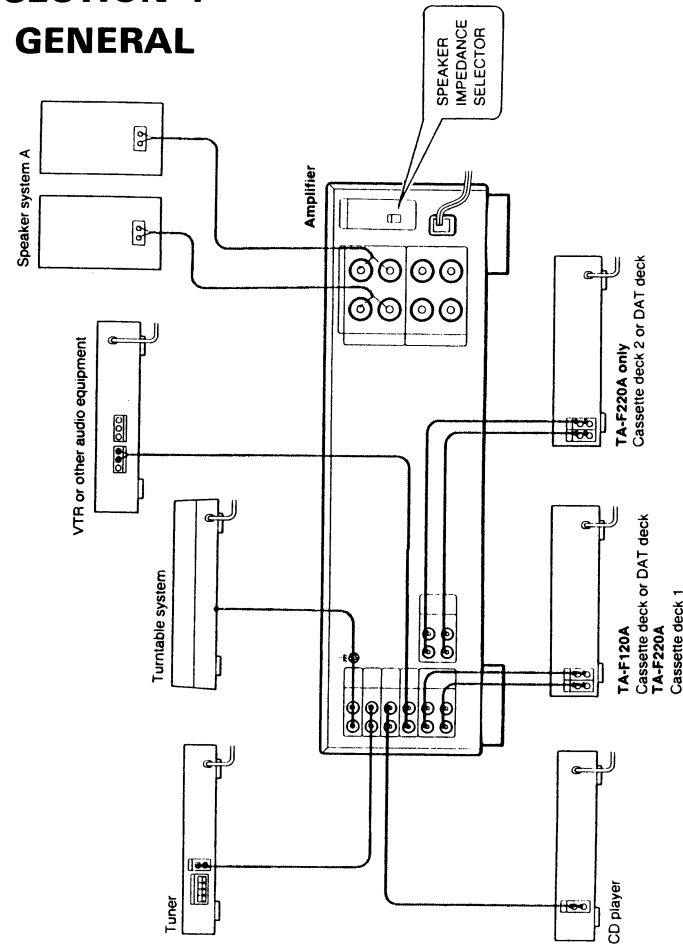
BALANCE
Balance control

TONE
Tone controls

HEADPHONES
Headphones jack

POWER
Power switch and indicator

SPEAKERS
Speaker selector

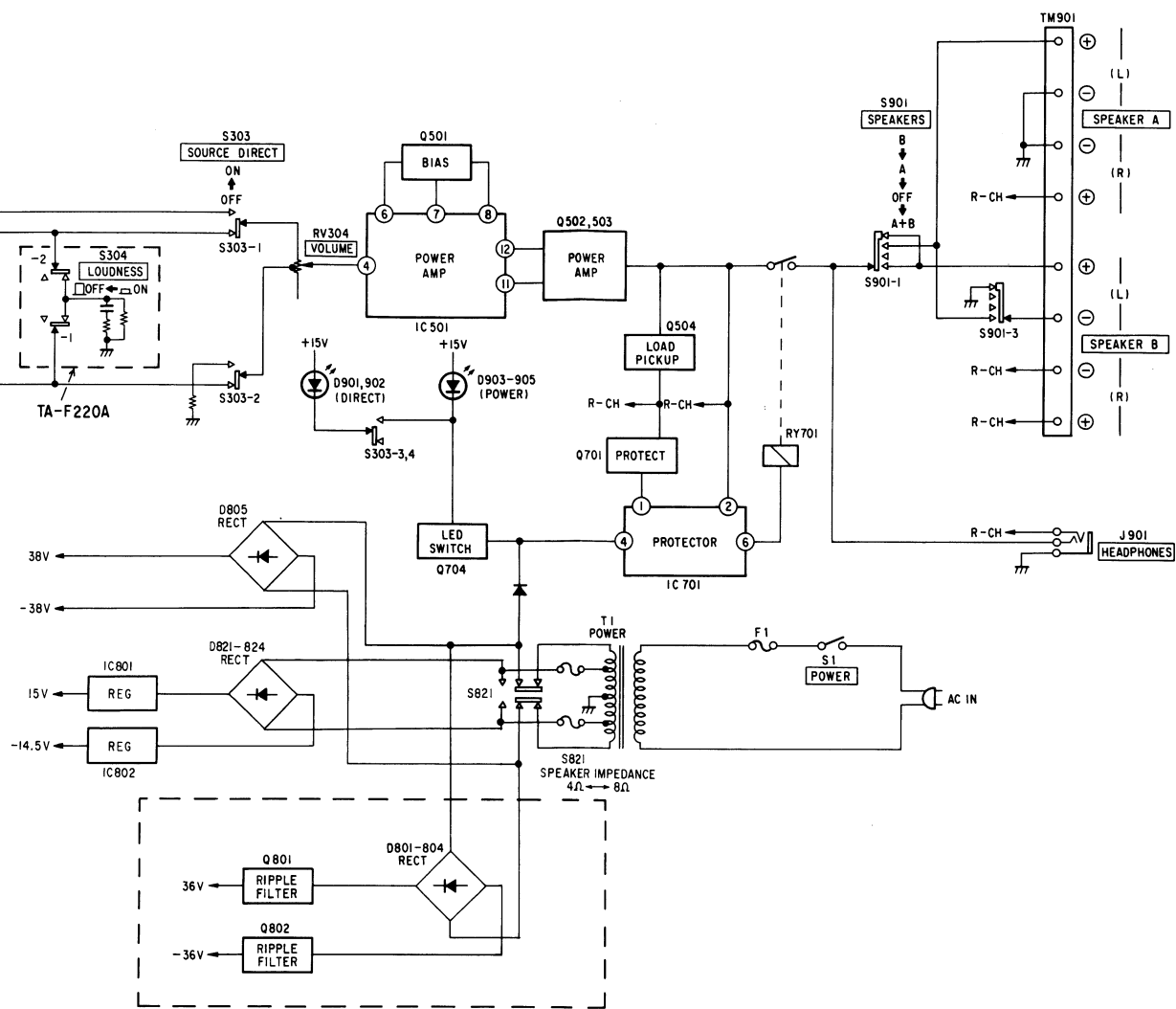


- Connect the AC power cord last. Make sure power is off.
- Cord plugs and jacks are color coded. Red plugs and jacks are for right channel (R) and white ones for left channel (L).
- Fully insert cable connectors into jacks. Loose connections may cause hum or noise.

The schematic diagram illustrates the internal circuitry of a stereo system, organized into three main functional blocks:

- TA-F120A (Input Selector and EQ Amp):** This section handles the input selection and initial signal processing. It includes an **S302 INPUT SELECTOR** with inputs for PHONO, TUNER, CD, VIDEO/AUX, TAPE 1, and TAPE 2/DAT. The selected signal passes through an **IC101 EQ AMP** and is then routed to the **S301 INPUT SELECTOR**. A **S304 TAPE/DAT MONITOR** switch allows for monitoring the tape or DAT input.
- TA-F220A (Tuner, Loudness, and Tone Controls):** This section contains the **S301 INPUT SELECTOR** (which also receives signals from the TA-F120A), a **RV301 BALANCE** control, and a **S304 LOUDNESS** switch. The signal path continues through **RV302 TREBLE** and **RV303 BASS** controls, and a **S302 REC OUT SELECTOR** for recording outputs.
- TA-F20A (Power Amp and Protection):** This section is responsible for driving the speaker. It features a **S303 SOURCE DIRECT** switch, a **RV304 VOLUME** control, and a **Q501 BIAS** control. The signal is then amplified by a **POWER AMP** (Q502, 503) and a **Q504 LOAD PICKUP**. A **Q701 PROTECT** circuit and a **Q704 LED SWITCH** are also shown.

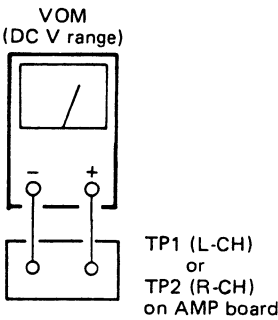
The power supply section includes three regulated rails: **38V**, **15V**, and **-14.5V**. These are derived from a transformer (T1) and regulated by **IC801** and **IC802**. A **S821 SPEAKER IMPEDANCE** network (4Ω to 8Ω) is used to match the speaker load. A **Q801 RIPPLE FILTER** and **Q802 RIPPLE FILTER** are also present.



NOTE:
• Adjustment should be performed 10 minutes after the POWER switch is on (POWER ON).

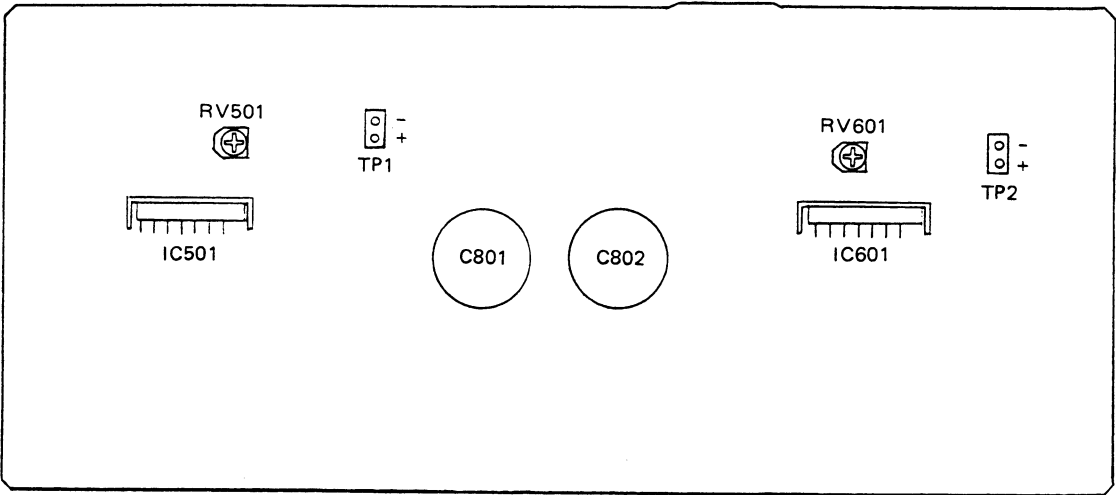
Bias Current Adjustment

Setting:
VOLUME control: minimum

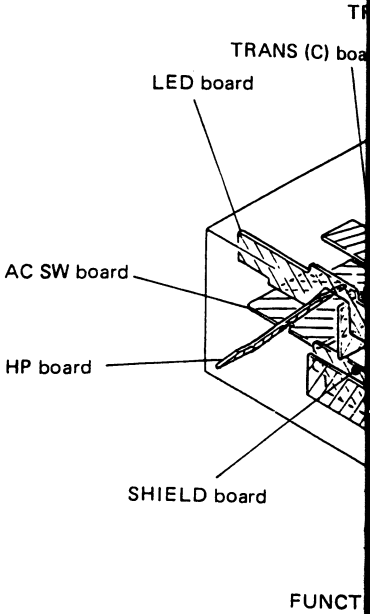


Procedure:
Adjust RV501 (L-CH) and RV601 (R-CH) so as to obtain 4mV (TA-F120A) or 2mV (TA-F220A) at TP1 (L-CH) and TP2 (R-CH) respectively.

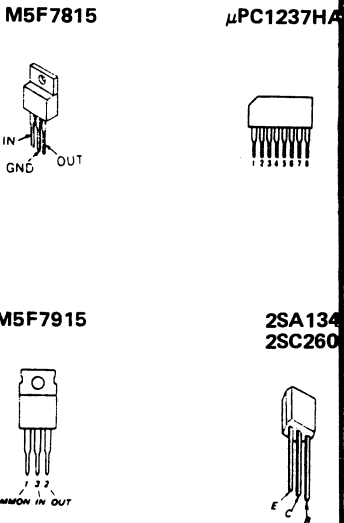
Adjustment Location:
[AMP BOARD] – Component Side –



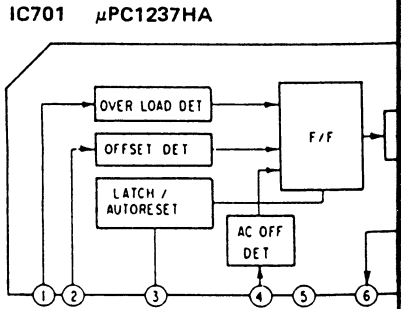
4-1. CIRCUIT BOARDS LOCATI



4-2. SEMICONDUCTOR LEAD LA



4-3. IC BLOCK DIAGRAMS



SECTION 3 ELECTRICAL ADJUSTMENTS

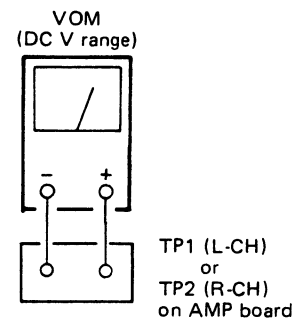
NOTE:

- Adjustment should be performed 10 minutes after the POWER switch is on (POWER ON).

Bias Current Adjustment

Setting:

VOLUME control: minimum

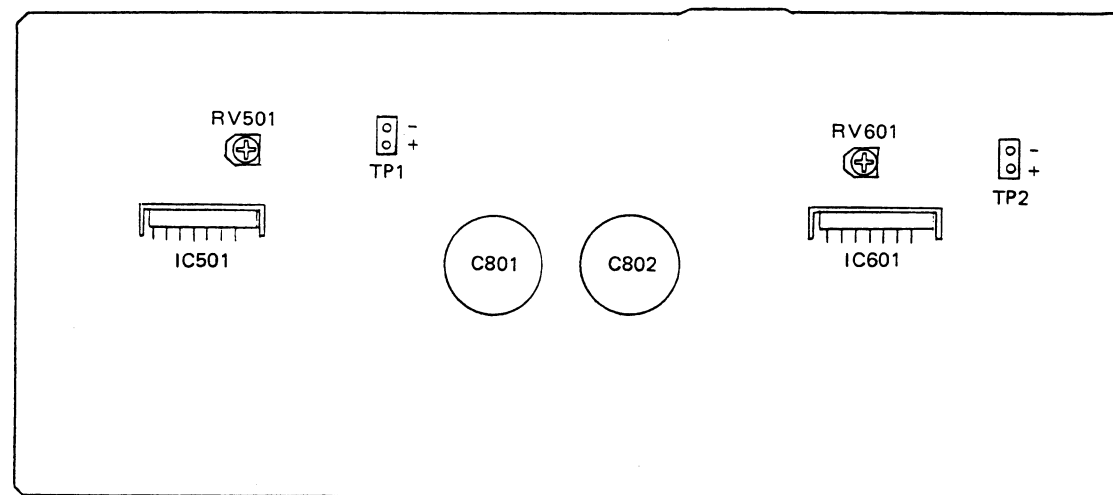


Procedure:

Adjust RV501 (L-CH) and RV601 (R-CH) so as to obtain 4mV (TA-F120A) or 2mV (TA-F220A) at TP1 (L-CH) and TP2 (R-CH) respectively.

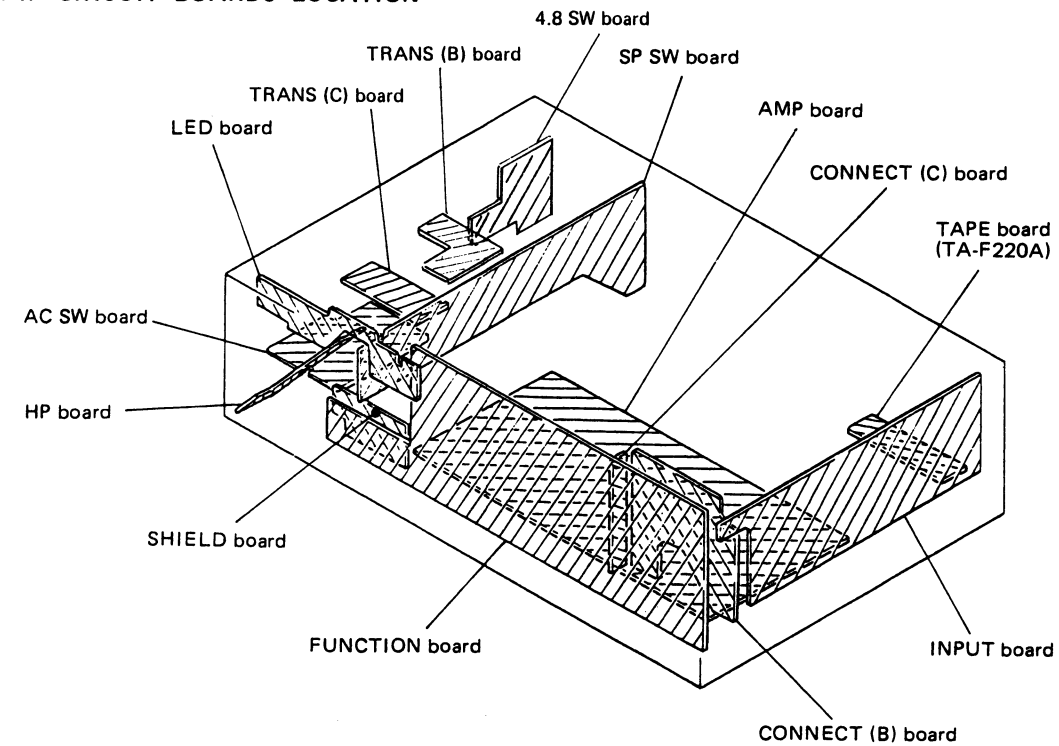
Adjustment Location:

[AMP BOARD] — Component Side —

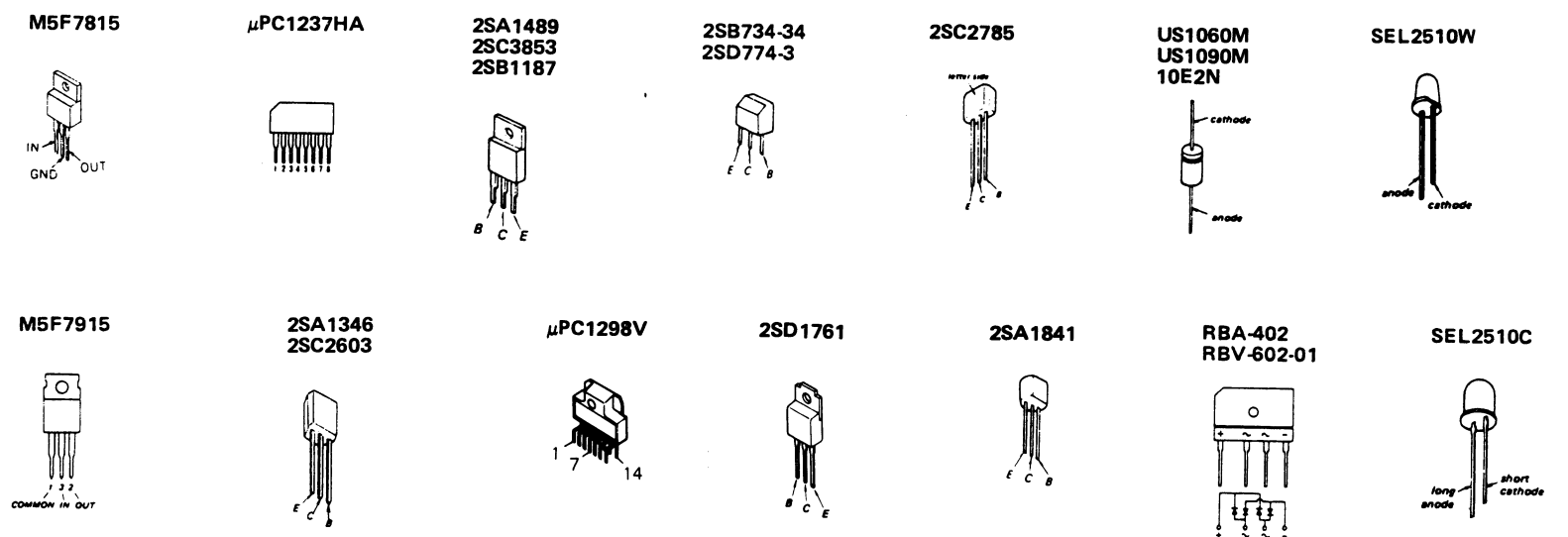


SECTION 4 DIAGRAMS

4-1. CIRCUIT BOARDS LOCATION

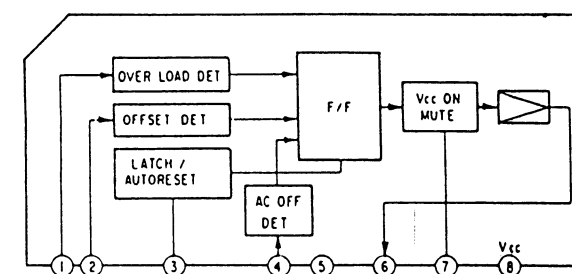


4-2. SEMICONDUCTOR LEAD LAYOUTS

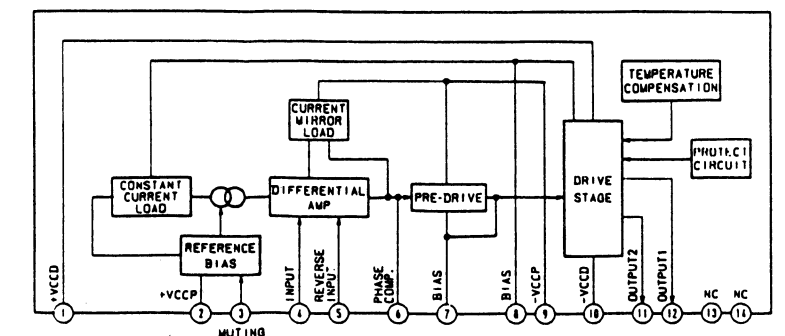


4-3. IC BLOCK DIAGRAMS

IC701 μ PC1237HA



IC501, 601 μ PC1298V

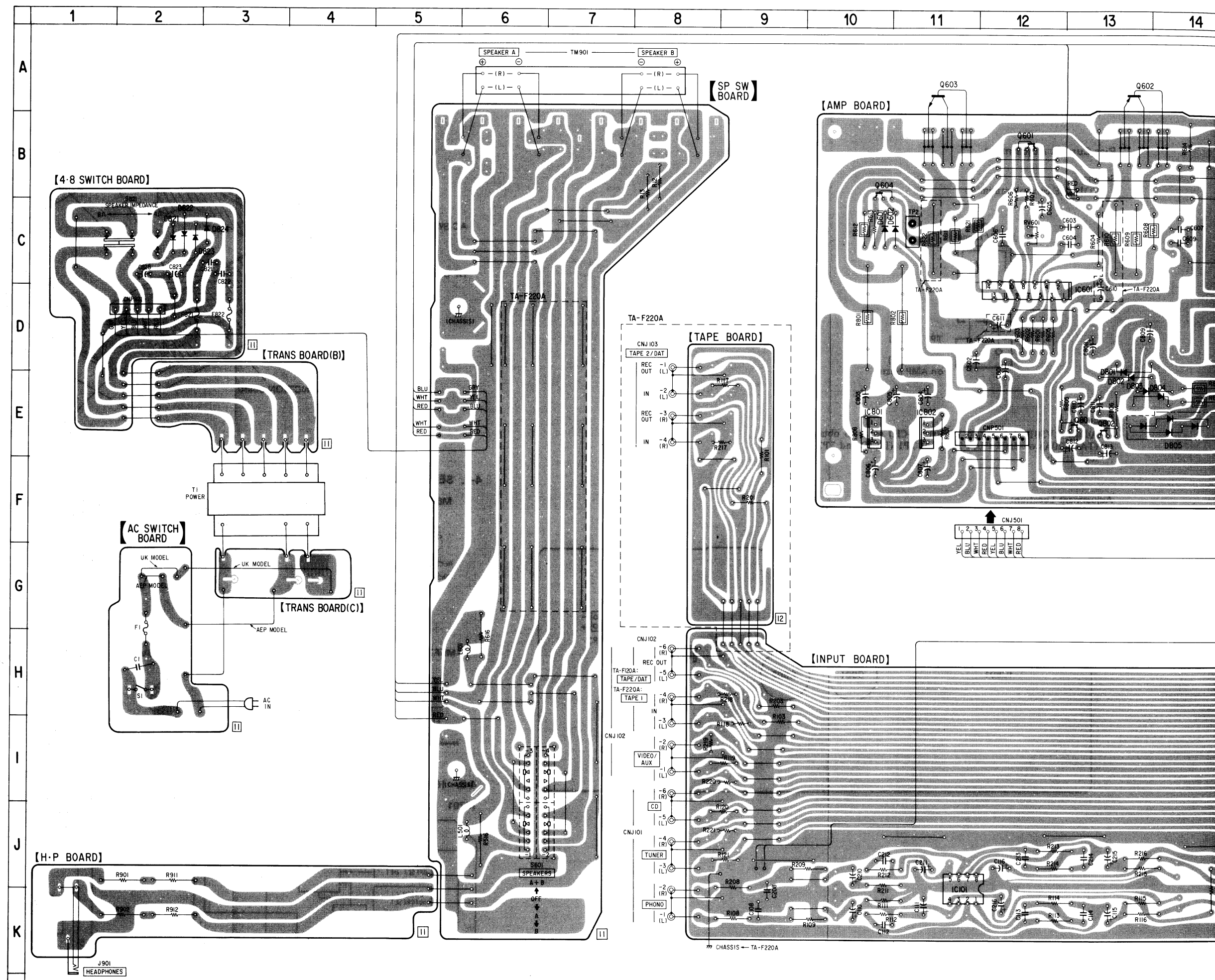


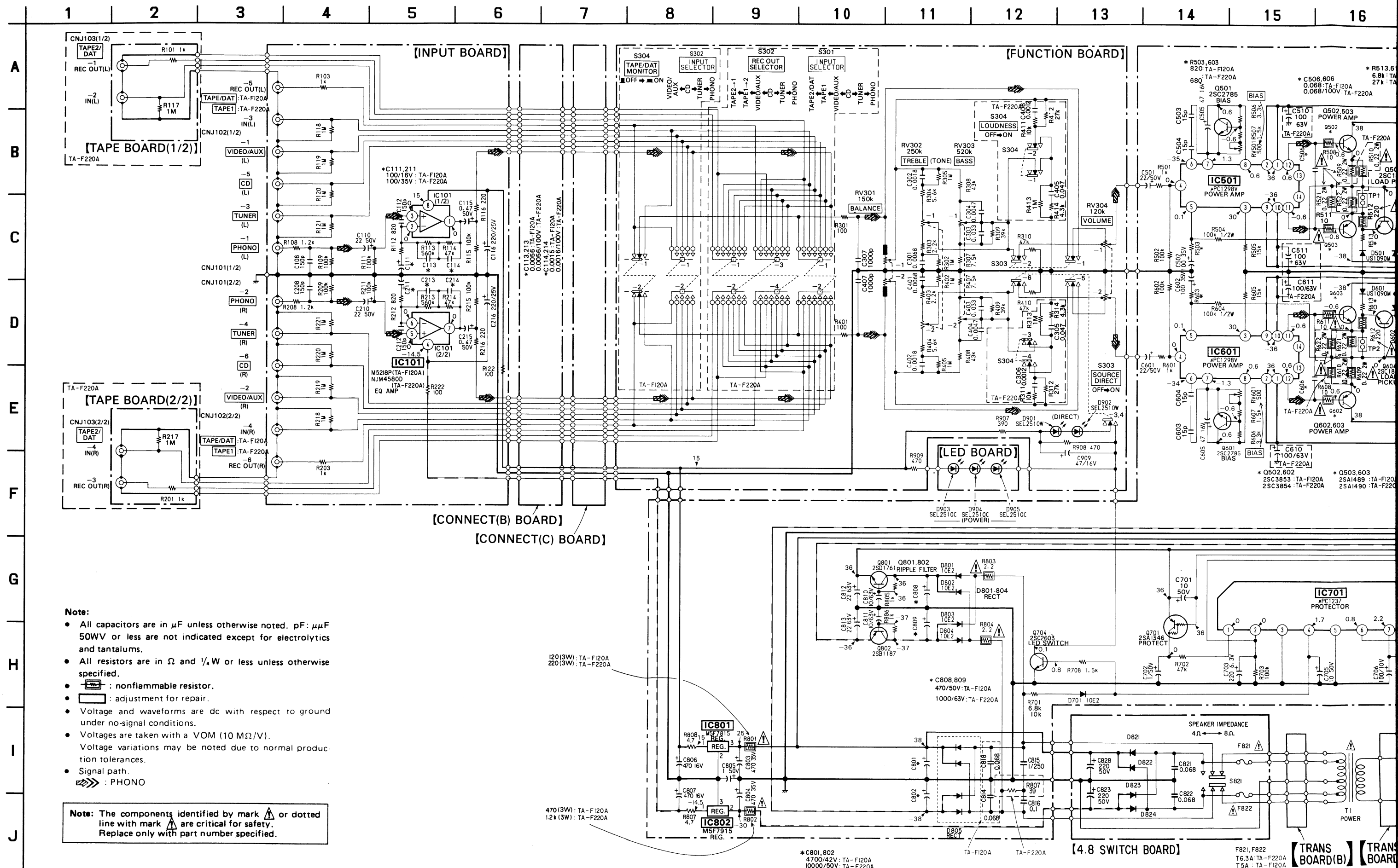
• Semiconductor Location

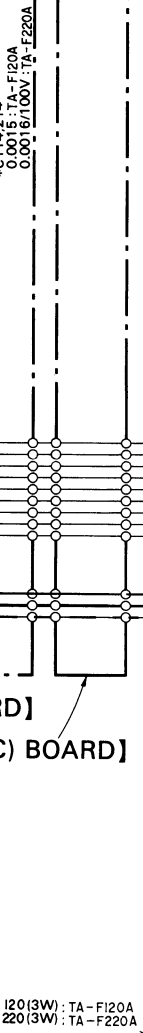
Ref. No.	Location	Ref. No.	Location
D501	C-16	IC101	K-11
D502	C-17	IC501	D-19
D601	C-10	IC601	D-12
D602	C-10	IC701	E-18
D701	E-17	IC802	E-10
D702	D-18	IC802	E-11
D703	D-18		
D801	D-13	Q501	B-18
D802	E-13	Q502	A-19
D803	E-13	Q503	A-16
D804	E-13	Q504	B-16
D805	E-14	Q601	B-12
D821	C-2	Q602	A-13
D822	C-2	Q603	A-11
D823	C-2	Q604	B-10
D824	C-2	Q701	E-17
D901 (F120A)	B-32	Q704	E-19
D901 (F220A)	G-32	Q801	E-13
D902 (F120A)	B-32	Q802	E-13
D902 (F220A)	G-32		
D903	G-16		
D904	G-16		
D905	G-16		

Note:

- ○ : parts extracted from the component side.









SECTION 5
EXPLODED VIEWS

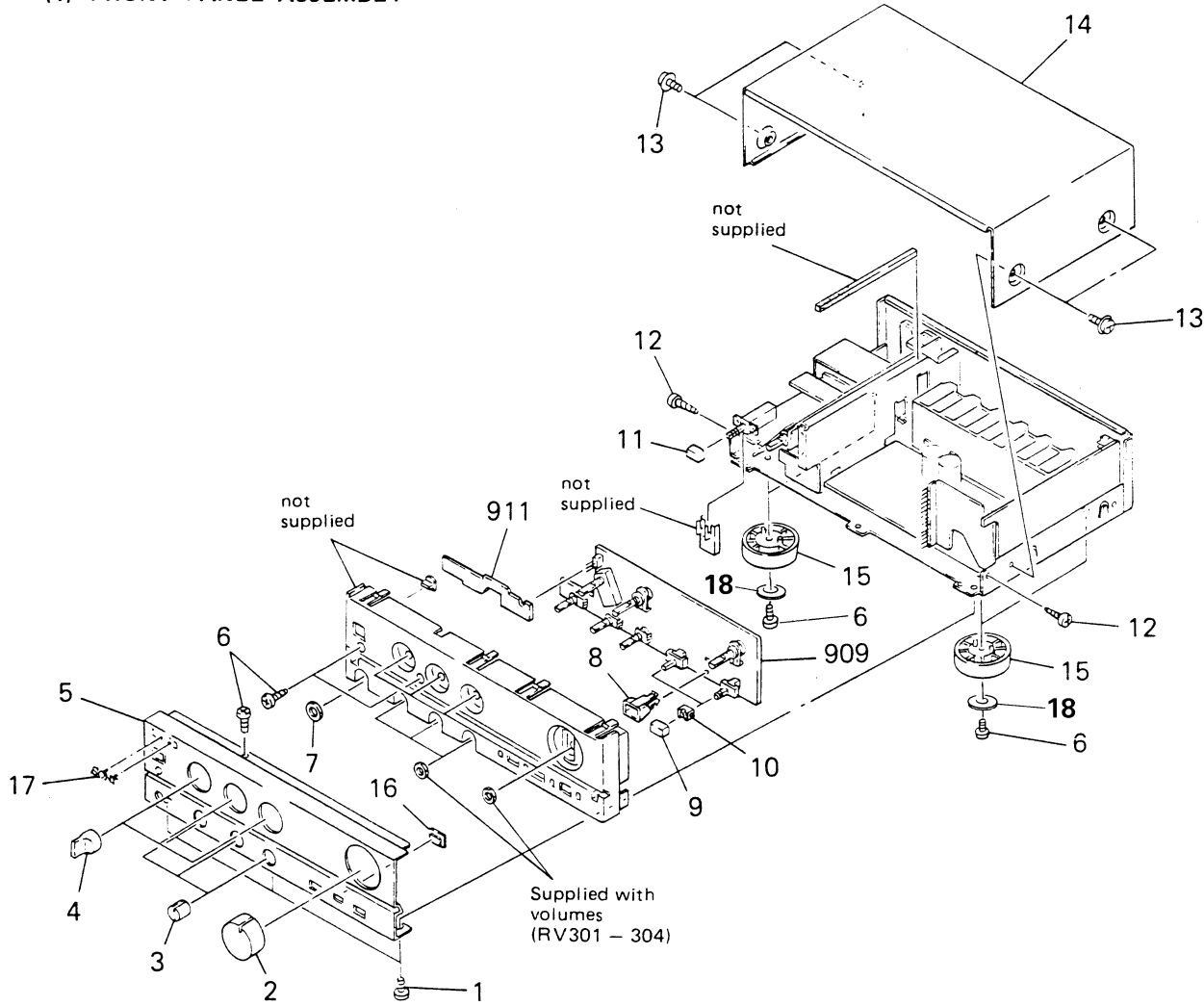
NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts Example:
(RED) ... KNOB, BALANCE (WHITE)
↑ Cabinet's Color ↑ Parts Color

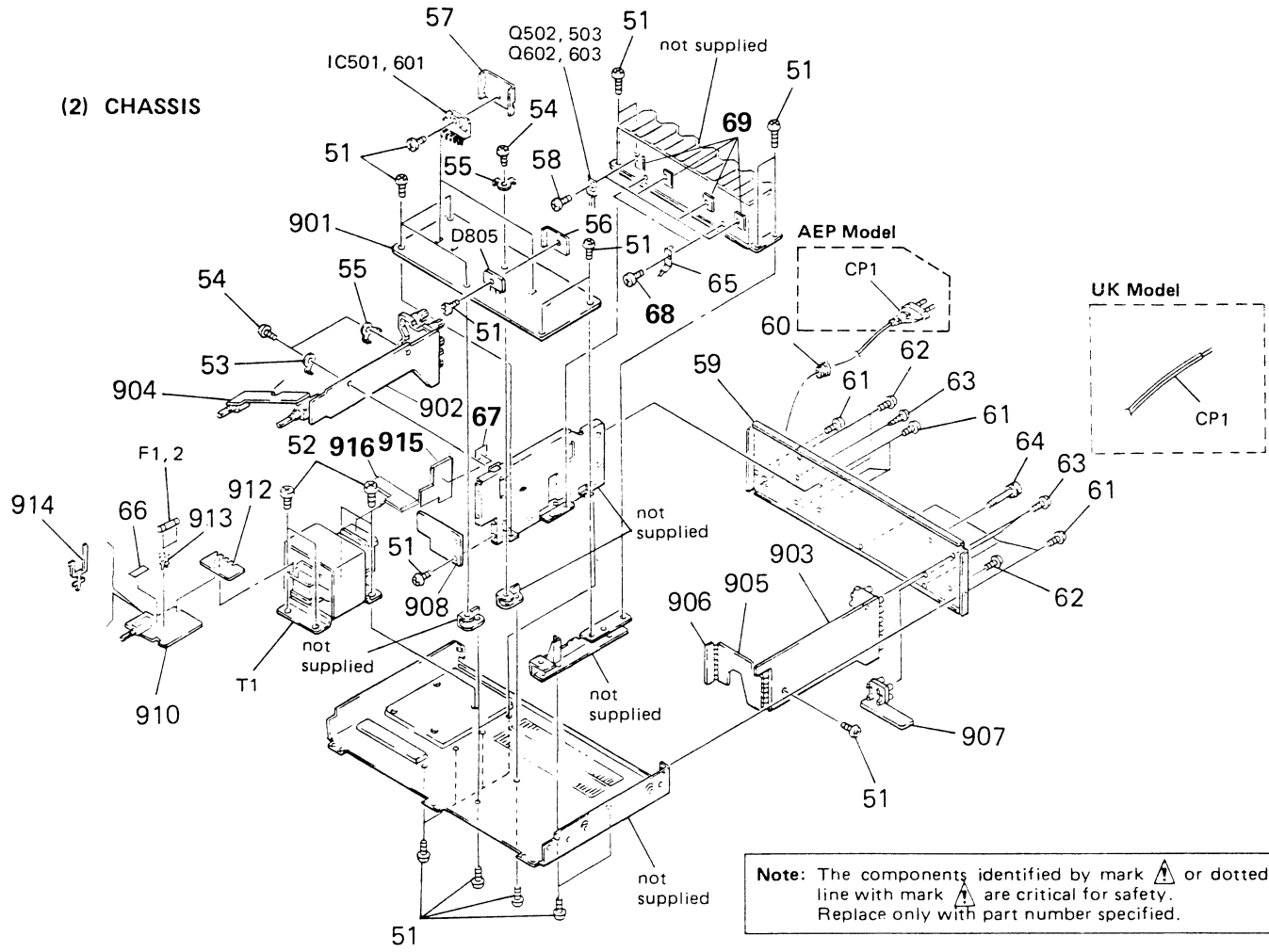
The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

(1) FRONT PANEL ASSEMBLY



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
1	3-703-685-21	SCREW (+BV 3X8)		10	4-864-307-00	RING	
2	4-929-288-11 (F120A)...KNOB (VOL 47)			11	4-929-289-01	BUTTON	
	4-929-299-01 (F220A)...KNOB (47)			12	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
3	4-916-746-11	KNOB (DIA. 21), ROUND		13	3-704-366-01	SCREW (CASE) (M3X8)	
4	4-916-729-01	KNOB (DIA.29)		14	4-929-294-11	CASE	
5	4-929-293-41 (F120A)...PANEL, FRONT			15	X-3304-938-2	FOOT ASSY	
	4-929-293-12 (F220A)...PANEL, FRONT			16	4-929-284-01	PLATE, INDICATION	
6	7-682-548-04	SCREW +BVTT 3X8 (S)		17	4-908-848-01	EMBLEM, SONY	
7	4-931-902-01	NUT (M12X1)		18	4-923-836-11	CUSHION	
8	*4-921-389-01	HOUSE					
9	4-908-875-01	KNOB, SQUARE		909	*1-630-937-12 (F220A)...PC BOARD, FUNCTION		
					*1-630-941-13 (F120A)...PC BOARD, FUNCTION		
				911	*1-630-939-11 (F220A)...PC BOARD, LED		
					*1-630-943-11 (F120A)...PC BOARD, LED		

(2) CHASSIS



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
51	7-682-548-04	SCREW +BVTT 3X8 (S)		902	*1-630-930-13	PC BOARD, SP SW	
52	7-682-560-04	SCREW +BVTT 4X6 (S)		903	*1-630-931-13	PC BOARD, INPUT	
53	4-870-539-00	PLATE, GROUND		904	*1-630-932-11	PC BOARD, H.P	
54	3-703-685-21	SCREW (+BV 3X8)		905	*1-630-933-11	PC BOARD, CONECT (B)	
55	*3-346-266-12	PLATE, GROUND		906	*1-630-934-12	PC BOARD, CONECT (C)	
56	*4-931-903-11	(F220A)...HEAT SINK (DI)		908	*1-630-936-12	PC BOARD, SHIELD	
57	*4-931-998-01 (F120A)...HEAT SINK (S)			910	*1-634-636-11	PC BOARD, AC SWITCH	
	*4-931-998-11 (F220A)...HEAT SINK (S)			912	*1-634-635-11	PC BOARD, TRANSFORMER (B)	
58	7-682-950-01	SCREW +PSW 3X12		913	*1-533-213-31	HOLDER, FUSE	
59	*4-929-269-52 (F220A:AEP)...PANEL, BACK			914	*1-535-115-00	TERMINAL	
	*4-929-269-72 (F220A:UK)...PANEL, BACK			915	*1-634-634-11	PC BOARD, 4.8 SWITCH	
	*4-931-974-11 (F120A:AEP)...PANEL, BACK			916	*1-634-637-11	PC BOARD, TRANSFORMER (C)	
	*4-931-974-31 (F120A:UK)...PANEL, BACK			CP1	*1-574-804-11 (UK)....CORD, POWER		
60	*3-703-244-00	BUSHING (2104), CORD		CP1	*1-574-805-11 (AEP)....CORD, POWER		
61	7-682-547-09	SCREW +BVTT 3X6 (S)		F1	*1-532-285-00 (F120A)...FUSE, TIME-LAG T1.25A		
62	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S		F1	*1-532-286-00 (F220A:AEP)...FUSE, TIME-LAG T2.5A		
63	7-621-849-00	SCREW, TAPPING		F1	*1-532-237-00 (F220A:UK)...FUSE, TIME-LAG T3.15A		
64	3-706-165-00	SCREW		F821	*1-532-299-00 (F120A)...FUSE, TIME-LAG T5A		
65	*4-929-285-01	BRACKET (TR)		F821	*1-532-325-00 (F220A)...FUSE, TIME-LAG T6.3A		
66	3-701-947-12	LABEL (T1.25A), FUSE		F822	*1-532-299-00 (F120A)...FUSE, TIME-LAG T5A		
67	3-701-947-18	LABEL (T5A), FUSE		F822	*1-532-325-00 (F220A)...FUSE, TIME-LAG T6.3A		
68	7-682-546-01	SCREW +B 3X5		T1	*1-450-060-11 (F220A)...TRANSFORMER, POWER		
69	4-911-232-01	SHEET, INSULATING		T1	*1-450-061-11 (F120A)...TRANSFORMER, POWER		
901	*A-4334-206-A (F120A)...MOUNTED PCB, AMPLIFIER						
	*A-4334-222-A (F220A)...MOUNTED PCB, AMPLIFIER						

NOTE:

- Due to list may the diag
- Items r
- are seld
- delay s
- items.
- If there
- such as
- circuit
- resistor

Ref.No.	Part
901	*A-4334-206-A (F120A)...MOUNTED PCB, AMPLIFIER
902	*1-630-930-13 PC BOARD, SP SW
903	*1-630-931-13 PC BOARD, INPUT
904	*1-630-932-11 PC BOARD, H.P
905	*1-630-933-11 PC BOARD, CONECT (B)
906	*1-630-934-12 PC BOARD, CONECT (C)
908	*1-630-936-12 PC BOARD, SHIELD
908	*1-634-636-11 PC BOARD, AC SWITCH
909	*1-634-635-11 PC BOARD, TRANSFORMER (B)
910	*1-533-213-31 HOLDER, FUSE
911	*1-535-115-00 TERMINAL
912	*1-634-634-11 PC BOARD, 4.8 SWITCH
913	*1-634-637-11 PC BOARD, TRANSFORMER (C)
914	*1-574-804-11 (UK)....CORD, POWER
916	*1-574-805-11 (AEP)....CORD, POWER
C1	1-16
C108	1-16
C110	1-12
C111	1-12
C111	1-12
C112	1-16
C113	1-13
C114	1-13
C114	1-13
C115	1-12
C116	1-12
C208	1-16
C210	1-12
C211	1-12
C211	1-12
C212	1-16
C213	1-13
C213	1-13
C214	1-13
C214	1-13
C215	1-12
C216	1-12
C301	1-13
C302	1-13

Identified by
mark
V.
rt number

13

ON
ON

SECTION 6 ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

MF: μ F, PF: μ F.

RESISTORS

- All resistors are in ohms.
- F: nonflammable

COILS

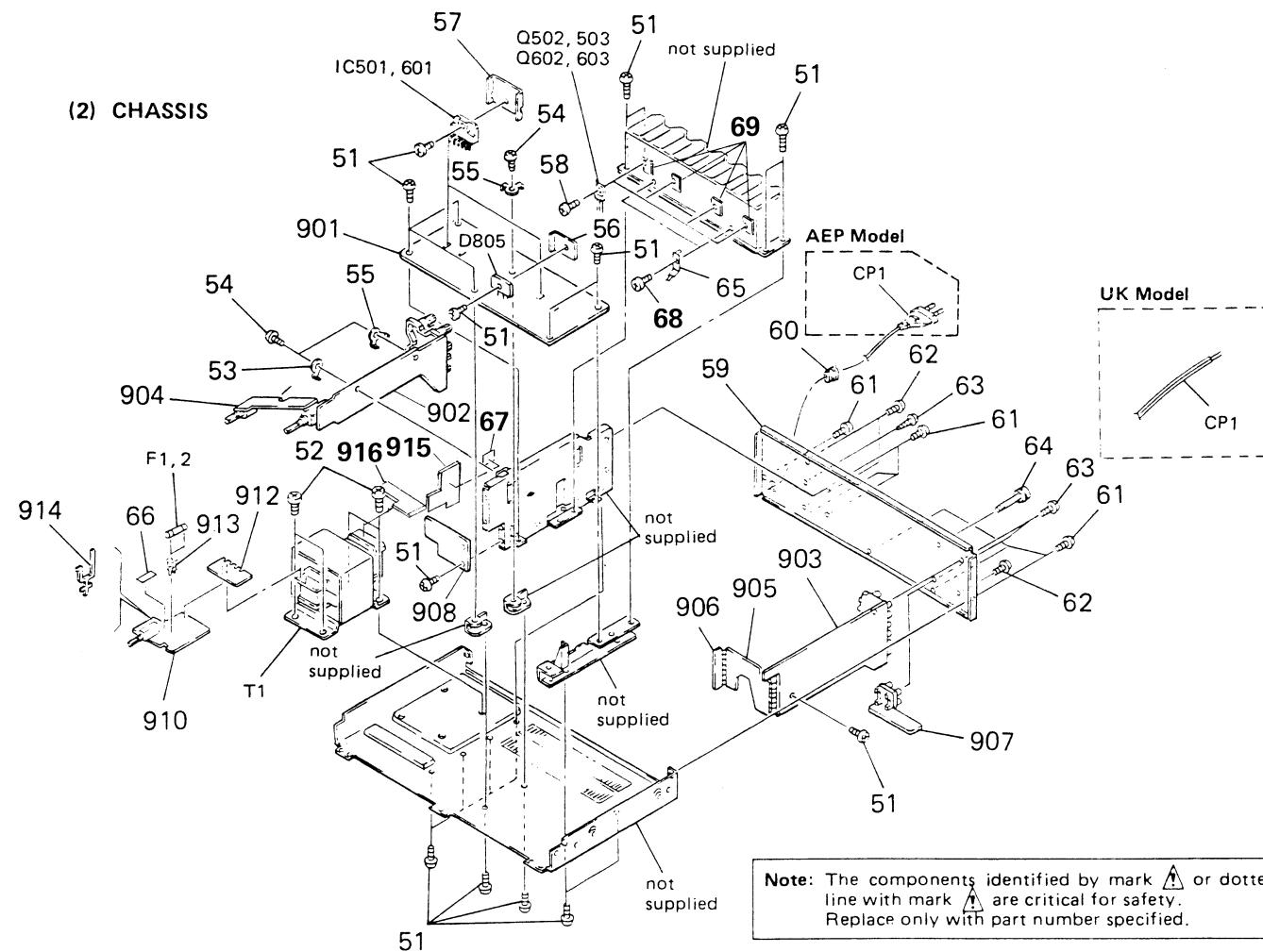
- MMH: mH, UH: μ H

SEMICONDUCTORS

In each case, U: μ , for example:

UA...: μ A..., UPA...: μ PA...,
UPC...: μ PC, UPD...: μ PD...

The components identified by
mark Δ or dotted line with mark
 Δ are critical for safety.
Replace only with part number
specified.



No.	Part No.	Description	Remarks
51	7-682-548-04	SCREW +BVTT 3X8 (S)	
52	7-682-560-04	SCREW +BVTT 4X6 (S)	
53	4-870-539-00	PLATE, GROUND	
54	3-703-685-21	SCREW (+BV 3X8)	
55	*3-346-266-12	PLATE, GROUND	
56	*4-931-903-11	(F220A)...HEAT SINK (DI)	
57	*4-931-998-01	(F120A)...HEAT SINK (S)	
	*4-931-998-11	(F220A)...HEAT SINK (S)	
58	7-682-950-01	SCREW +PSW 3X12	
59	*4-929-269-52	(F220A:AEP)...PANEL, BACK	
	*4-929-269-72	(F220A:UK)...PANEL, BACK	
	*4-931-974-11	(F120A:AEP)...PANEL, BACK	
	*4-931-974-31	(F120A:UK)...PANEL, BACK	
60	*3-703-244-00	BUSHING (2104), CORD	
61	7-682-547-09	SCREW +BVTT 3X6 (S)	
62	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
63	7-621-849-00	SCREW, TAPPING	
64	3-706-165-00	SCREW	
65	*4-929-285-01	BRACKET (TR)	
66	3-701-947-12	LABEL (T1.25A), FUSE	
67	3-701-947-18	LABEL (T5A), FUSE	
68	7-682-546-01	SCREW +B 3X5	
69	4-911-232-01	SHEET, INSULATING	
901	*A-4334-206-A	(F120A)...MOUNTED PCB, AMPLIFIER	
	*A-4334-222-A	(F220A)...MOUNTED PCB, AMPLIFIER	

No.	Part No.	Description	Remarks
902	*1-630-930-13	PC BOARD, SP SW	
903	*1-630-931-13	PC BOARD, INPUT	
904	*1-630-932-11	PC BOARD, H.P	
905	*1-630-933-11	PC BOARD, CONECT (B)	
906	*1-630-934-12	PC BOARD, CONECT (C)	
908	*1-630-936-12	PC BOARD, SHIELD	
910	*1-634-636-11	PC BOARD, AC SWITCH	
912	*1-634-635-11	PC BOARD, TRANSFORMER (B)	
913	*1-533-213-31	HOLDER, FUSE	
914	*1-535-115-00	TERMINAL	
915	*1-634-634-11	PC BOARD, 4.8 SWITCH	
916	*1-634-637-11	PC BOARD, TRANSFORMER (C)	
CP1	*1-574-804-11	(UK)...CORD, POWER	
CP1	*1-574-805-11	(AEP)...CORD, POWER	
F1	*1-532-285-00	(F120A)...FUSE, TIME-LAG T1.25A	
F1	*1-532-286-00	(F220A:AEP)...FUSE, TIME-LAG T2.5A	
F1	*1-532-237-00	(F220A:UK)...FUSE, TIME-LAG T3.15A	
F821	*1-532-299-00	(F120A)...FUSE, TIME-LAG T5A	
F821	*1-532-325-00	(F220A)...FUSE, TIME-LAG T6.3A	
F822	*1-532-299-00	(F120A)...FUSE, TIME-LAG T5A	
F822	*1-532-325-00	(F220A)...FUSE, TIME-LAG T6.3A	
T1	*1-450-060-11	(F220A)...TRANSFORMER, POWER	
T1	*1-450-061-11	(F120A)...TRANSFORMER, POWER	

Ref.No.	Part No.	Description
901	*A-4334-206-A	(F120A)...MOUNTED PCB, AMPLIFIER
	*A-4334-222-A	(F220A)...MOUNTED PCB, AMPLIFIER
902	*1-630-930-13	PC BOARD, SP SW
903	*1-630-931-13	PC BOARD, INPUT
904	*1-630-932-11	PC BOARD, H.P
905	*1-630-933-11	PC BOARD, CONECT (B)
906	*1-630-934-12	PC BOARD, CONECT (C)
908	*1-630-936-12	PC BOARD, SHIELD
909	*1-630-937-12	(F220A)...PC BOARD, FUNCTION
	*1-630-941-13	(F120A)...PC BOARD, FUNCTION
910	*1-634-636-11	PC BOARD, AC SWITCH
911	*1-630-939-11	(F220A)...PC BOARD, LED
	*1-630-943-11	(F120A)...PC BOARD, LED
912	*1-634-635-11	PC BOARD, TRANSFORMER (B)
913	*1-533-213-31	HOLDER, FUSE
914	*1-535-115-00	TERMINAL
915	*1-634-634-11	PC BOARD, 4.8 SWITCH
916	*1-634-637-11	PC BOARD, TRANSFORMER (C)
C1	1-161-744-00	CERAMIC 10000P 400V
C108	1-164-075-11	CERAMIC 150PF 10% 50V
C110	1-126-233-11	ELECT 22MF 20% 50V
C111	1-123-345-00	(F220A)...ELECT 100MF 20% 35V
C111	1-126-101-11	(F120A)...ELECT 100MF 20% 16V
C112	1-164-075-11	CERAMIC 150PF 10% 50V
C113	1-130-480-00	MYLAR 0.0056MF 5% 50V
C114	1-130-473-00	(F120A)...MYLAR 0.0015MF 5% 50V
C114	1-136-229-11	(F220A)...FILM 0.0016MF 5% 100V
C115	1-124-902-00	ELECT 0.47MF 20% 50V
C116	1-124-120-11	ELECT 220MF 20% 25V
C208	1-164-075-11	CERAMIC 150PF 10% 50V
C210	1-126-233-11	ELECT 22MF 20% 50V
C211	1-123-345-00	(F220A)...ELECT 100MF 20% 35V
C211	1-126-101-11	(F120A)...ELECT 100MF 20% 16V
C212	1-164-075-11	CERAMIC 150PF 10% 50V
C213	1-130-339-00	(F220A)...FILM 0.0056MF 5% 100V
C213	1-130-480-00	(F120A)...MYLAR 0.0056MF 5% 50V
C214	1-130-473-00	(F120A)...MYLAR 0.0015MF 5% 50V
C214	1-136-229-11	(F220A)...FILM 0.0016MF 5% 100V
C215	1-124-902-00	ELECT 0.47MF 20% 50V
C216	1-124-120-11	ELECT 220MF 20% 25V
C301	1-130-481-00	MYLAR 0.0068MF 5% 50V
C302	1-130-474-00	MYLAR 0.0018MF 5% 50V

Ref.No.	Part No.	Description
C303	1-136-159-00	FILM 0.033MF 5% 50V
C304	1-130-479-00	MYLAR 0.0047MF 5% 50V
C305	1-136-161-00	(F220A)...FILM 0.047MF 5% 50V
C306	1-164-086-11	(F220A)...CERAMIC 0.0012MF 10% 50V
C307	1-164-085-11	CERAMIC 0.001MF 10% 50V
C401	1-130-481-00	MYLAR 0.0068MF 5% 50V
C402	1-130-474-00	MYLAR 0.0018MF 5% 50V
C403	1-136-159-00	FILM 0.033MF 5% 50V
C404	1-130-479-00	MYLAR 0.0047MF 5% 50V
C405	1-136-161-00	(F220A)...FILM 0.047MF 5% 50V
C406	1-164-086-11	(F220A)...CERAMIC 0.0012MF 10% 50V
C407	1-164-085-11	CERAMIC 0.001MF 10% 50V
C501	1-126-233-11	ELECT 22MF 20% 50V
C502	1-126-052-11	ELECT 100MF 20% 35V
C503	1-164-023-11	CERAMIC 15PF 5% 50V
C504	1-164-023-11	CERAMIC 15PF 5% 50V
C505	1-124-477-11	ELECT 47MF 20% 16V
C506	1-130-317-00	(F220A)...FILM 0.068MF 5% 100V
C506	1-136-163-00	(F120A)...FILM 0.068MF 5% 50V
C507	1-136-163-00	FILM 0.068MF 5% 50V
C509	1-136-163-00	FILM 0.068MF 5% 50V
C510	1-126-063-00	(F220A)...FILM 100MF 20% 63V
C511	1-126-063-00	(F220A)...FILM 100MF 20% 63V
C601	1-126-233-11	ELECT 22MF 20% 50V
C602	1-126-052-11	ELECT 100MF 20% 35V
C603	1-164-023-11	CERAMIC 15PF 5% 50V
C604	1-164-023-11	CERAMIC 15PF 5% 50V
C605	1-124-477-11	ELECT 47MF 20% 16V
C606	1-130-317-00	(F220A)...FILM 0.068MF 5% 100V
C606	1-136-163-00	(F120A)...FILM 0.068MF 5% 50V
C607	1-136-163-00	FILM 0.068MF 5% 50V
C609	1-136-163-00	FILM 0.068MF 5% 50V
C610	1-126-063-00	(F220A)...FILM 100MF 20% 63V
C611	1-126-063-00	(F220A)...FILM 100MF 20% 63V
C701	1-123-875-11	ELECT 10MF 20% 50V
C702	1-124-791-11	ELECT 1MF 20% 50V
C703	1-126-176-11	ELECT 220MF 20% 6.3V
C705	1-123-875-11	ELECT 10MF 20% 50V
C706	1-124-443-00	ELECT 100MF 20% 10V
C801	1-126-224-11	(F120A)...ELECT 4700MF 20% 42V
C801	1-125-596-11	(F220A)...ELECT(BLOCK) 10000MF 20% 50V
C802	1-126-224-11	(F120A)...ELECT 4700MF 20% 42V
C802	1-125-596-11	(F220A)...ELECT(BLOCK) 10000MF 20% 50V
C803	1-126-104-11	ELECT 470MF 20% 35V
C804	1-126-104-11	ELECT 470MF 20% 35V
C805	1-124-791-11	ELECT 1MF 20% 50V
C806	1-126-103-11	ELECT 470MF 20% 16V
C807	1-126-103-11	ELECT 470MF 20% 16V

Ref.No.	Part No.	Description			
C808	1-124-913-11	(F120A)...ELECT	470MF	20%	50V
C808	1-126-067-11	(F220A)...ELECT	1000MF	20%	63V
C809	1-124-913-11	(F120A)...ELECT	470MF	20%	50V
C809	1-126-067-11	(F220A)...ELECT	1000MF	20%	63V
C810	1-126-233-11	(F120A)...ELECT	22MF	20%	50V
C810	1-126-059-11	(F220A)...ELECT	10MF	20%	63V
C811	1-126-233-11	(F120A)...ELECT	22MF	20%	50V
C811	1-126-059-11	(F220A)...ELECT	10MF	20%	63V
C812	1-126-233-11	(F120A)...ELECT	22MF	20%	50V
C812	1-126-060-11	(F220A)...ELECT	22MF	20%	63V
C813	1-126-233-11	(F120A)...ELECT	22MF	20%	50V
C813	1-126-060-11	(F220A)...ELECT	22MF	20%	63V
C814	1-136-163-00	(F120A)...FILM	0.068MF	5%	50V
C815	1-130-798-00	(F220A)...FILM	1MF	10%	250V
C816	1-136-165-00	(F220A)...FILM	0.1MF	5%	50V
C818	1-136-163-00	(F120A)...FILM	0.068MF	5%	50V
C821	1-136-163-00	FILM	0.068MF	5%	50V
C822	1-136-163-00	FILM	0.068MF	5%	50V
C823	1-124-911-11	ELECT	220MF	20%	50V
C828	1-124-911-11	ELECT	220MF	20%	50V
C909	1-124-477-11	ELECT	47MF	20%	16V
CN1	*1-564-321-00	PIN, CONNECTOR 2P			
CNJ101	1-565-320-11	(F120A, F220A: UK) ... JACK, PIN 6P			
CNJ101	1-565-320-61	(F220A: AEP) ... JACK, PIN 6P			
CNJ102	1-565-320-11	(F120A, F220A: UK) ... JACK, PIN 6P			
CNJ102	1-565-320-61	(F220A: AEP) ... JACK, PIN 6P			
CNJ103	1-568-529-21	(F220A)...JACK, PIN 4P			
CNJ301	1-565-961-11	SOCKET, CONNECTOR 20P			
CNJ302	*1-565-835-11	(F120A)...SOCKET, CONNECTOR 3P			
CNP301	1-565-419-11	PIN, CONNECTOR 10P			
CNP302	1-565-419-11	(F120A)...PIN, CONNECTOR 10P			
CNP303	1-506-906-11	(F220A)...PIN, CONNECTOR 5P			
CNP304	1-568-577-11	(F120A)...PIN, CONNECTOR (PC BOARD)3P			
CNP501	*1-564-511-11	PLUG, CONNECTOR 8P			
CNP821	*1-564-242-00	PIN, CONNECTOR 5P			
CP1	△1-574-804-11	(UK)....CORD, POWER			
CP1	△1-574-805-11	(AEP)....CORD, POWER			
D501	8-719-815-85	DIODE 1S1585			
D502	8-719-815-85	DIODE 1S1585			
D601	8-719-815-85	DIODE 1S1585			
D602	8-719-815-85	DIODE 2S1585			
D701	8-719-200-77	DIODE 10E2N			
D702	8-719-912-20	DIODE 1SS120			
D703	8-719-912-20	DIODE 1SS120			
D801	8-719-200-77	DIODE 10E2N			
D802	8-719-200-77	DIODE 10E2N			
D803	8-719-200-77	DIODE 10E2N			
D804	8-719-200-77	DIODE 10E2N			
D805	8-719-312-09	DIODE RBA-402			
D821	8-719-200-77	DIODE 10E2N			
D822	8-719-200-77	DIODE 10E2N			
D823	8-719-200-77	DIODE 10E2N			
D824	8-719-200-77	DIODE 10E2N			
U901	8-719-304-14	DIODE SEL2510W (DIRECT)			
D902	8-719-304-14	DIODE SEL2510W (DIRECT)			
D903	8-719-303-00	DIODE SEL2510C (POWER)			
D904	8-719-303-00	DIODE SEL2510C (POWER)			
D905	8-719-303-00	DIODE SEL2510C (POWER)			



Note: The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description			
F1	△1-532-285-00	(F120A)...FUSE, TIME-LAG T1.25A			
F1	△1-532-286-00	(F220A:AEP)...FUSE, TIME-LAG T2.5A			
F1	△1-532-237-00	(F220A:UK)....FUSE, TIME-LAG T3.15A			
F821	△1-532-299-00	(F120A)...FUSE, TIME-LAG T5A			
F821	△1-532-325-00	(F220A)...FUSE, TIME-LAG T6.3A			
F822	△1-532-299-00	(F120A)...FUSE, TIME-LAG T5A			
F822	△1-532-325-00	(F220A)...FUSE, TIME-LAG T6.3A			
IC101	8-759-601-02	(F120A)...IC M5218P			
IC101	8-759-711-35	(F220A)...IC NJM4580D			
IC501	8-759-109-06	IC UPC1298V			
IC601	8-759-109-06	IC UPC1298V			
IC701	8-759-111-68	IC UPC1237HA			
IC801	8-759-604-34	IC M5F7815			
IC802	8-759-604-52	IC M5F7915			
J901	1-507-863-51	JACK, LARGE TYPE (HEADPHONES)			
L501	*1-420-872-00	COIL, AIR CORE			
L601	*1-420-872-00	COIL, AIR CORE			
Q501	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q502	8-729-322-08	(F120A)... TRANSISTOR 2SC3853LF-0Y			
Q502	8-729-321-99	(F220A)... TRANSISTOR 2SC3854LF-0Y			
Q503	8-729-322-11	(F120A)... TRANSISTOR 2SA1489LF-0Y			
Q503	8-729-322-05	(F220A)... TRANSISTOR 2SA1490LF-0Y			
Q504	8-729-140-84	TRANSISTOR 2SC1841-PAFAEA			
Q601	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q602	8-729-322-08	(F120A)... TRANSISTOR 2SC3853LF-0Y			
Q602	8-729-321-99	(F220A)... TRANSISTOR 2SC3854LF-0Y			
Q603	8-729-322-11	(F120A)... TRANSISTOR 2SA1489LF-0Y			
Q603	8-729-322-05	(F220A)... TRANSISTOR 2SA1490LF-0Y			
Q604	8-729-140-84	TRANSISTOR 2SC1841-PAFAEA			
Q701	8-729-900-63	TRANSISTOR DTA124ES			
Q704	8-729-620-05	TRANSISTOR 2SC2603-EF			
Q801	8-729-920-98	TRANSISTOR 2SD1761-EF			
Q802	8-729-920-97	TRANSISTOR 2SB1187-EF			
R11	1-249-405-11	CARBON	100	5%	1/4W
R12	1-249-405-11	CARBON	100	5%	1/4W
R13	1-249-405-11	CARBON	100	5%	1/4W
R101	1-247-713-11	(F220A)...CARBON	1K	5%	1/4W
R103	1-247-713-11	CARBON	1K	5%	1/4W
R108	1-247-714-11	CARBON	1.2K	5%	1/4W
R109	1-249-469-11	CARBON	100K	5%	1/4W
R111	1-249-469-11	CARBON	100K	5%	1/4W
R112	1-247-712-11	CARBON	820	5%	1/4W
R113	1-246-539-00	CARBON	560K	5%	1/4W
R114	1-249-465-11	CARBON	47K	5%	1/4W
R115	1-249-469-11	CARBON	100K	5%	1/4W
R116	1-247-704-11	CARBON	220	5%	1/4W
R117	1-247-903-00	(F220A)...CARBON	1M	5%	1/4W
R118	1-247-903-00	CARBON	1M	5%	1/4W
R119	1-247-903-00	CARBON	1M	5%	1/4W
R120	1-247-903-00	CARBON	1M	5%	1/4W
R121	1-247-903-00	CARBON	1M	5%	1/4W
R122	1-247-700-11	CARBON	100	5%	1/4W
R201	1-247-713-11	(F220A)...CARBON	1K	5%	1/4W
R203	1-247-713-11	CARBON	1K	5%	1/4W
R208	1-247-714-11	CARBON	1.2K	5%	1/4W
R209	1-249-469-11	CARBON	100K	5%	1/4W
R211	1-249-469-11	CARBON	100K	5%	1/4W
R212	1-247-712-11	CARBON	820	5%	1/4W
R213	1-246-539-00	CARBON	560K	5%	1/4W
R214	1-249-465-11	CARBON	47K	5%	1/4W
R215	1-249-469-11	CARBON	100K	5%	1/4W
R216	1-247-704-11	CARBON	220	5%	1/4W
R217	1-247-903-00	(F220A)...CARBON	1M	5%	1/4W

TA-F120A/F220A

Ref.No.	Part No.	Description			
R218	1-247-903-00	CARBON	1M	5%	1/4W
R219	1-247-903-00	CARBON	1M	5%	1/4W
R220	1-247-903-00	CARBON	1M	5%	1/4W
R221	1-247-903-00	CARBON	1M	5%	1/4W
R222	1-247-700-11	CARBON	100	5%	1/4W
R301	1-247-700-11	CARBON	100	5%	1/4W
R302	1-246-545-00	CARBON	1M	5%	1/4W
R303	1-247-717-11	CARBON	2.2K	5%	1/4W
R304	1-247-722-11	CARBON	5.6K	5%	1/4W
R305	1-246-545-00	CARBON	1M	5%	1/4W
R307	1-247-152-00	CARBON	7.5K	5%	1/4W
R308	1-247-170-00	CARBON	43K	5%	1/4W
R309	1-249-464-11	CARBON	39K	5%	1/4W
R310	1-249-465-11	CARBON	47K	5%	1/4W
R311	1-249-429-11	(F220A)...CARBON	10K	5%	1/4W
R312	1-249-434-11	(F220A)...CARBON	27K	5%	1/4W
R313	1-247-903-00	(F220A)...CARBON	1M	5%	1/4W
R314	1-247-846-11	(F220A)...CARBON	4.3K	5%	1/4W
R401	1-247-700-11	CARBON	100	5%	1/4W
R402	1-246-545-00	CARBON	1M	5%	1/4W
R403	1-247-717-11	CARBON	2.2K	5%	1/4W
R404	1-247-722-11	CARBON	5.6K	5%	1/4W
R405	1-246-545-00	CARBON	1M	5%	1/4W
R407	1-247-152-00	CARBON	7.5K	5%	1/4W
R408	1-247-170-00	CARBON	43K	5%	1/4W
R409	1-249-464-11	CARBON	39K	5%	1/4W
R410	1-249-465-11	CARBON	47K	5%	1/4W
R411	1-249-429-11	(F220A)...CARBON	10K	5%	1/4W
R412	1-249-434-11	(F220A)...CARBON	27K	5%	1/4W
R413	1-247-903-00	(F220A)...CARBON	1M	5%	1/4W
R414	1-247-846-11	(F220A)...CARBON	4.3K	5%	1/4W
R501	1-247-713-11	CARBON	1K	5%	1/4W
R502	1-249-469-11	CARBON	100K	5%	1/4W
R503	1-247-712-11	(F120A)...CARBON	820	5%	1/4W
R503	1-247-711-11	(F220A)...CARBON	680	5%	1/4W
R504	1-249-496-11	CARBON	100K	5%	1/2W
R505	1-249-460-11	CARBON	15K	5%	1/4W
R506	1-249-423-11	CARBON	3.3K	5%	1/4W
R507	1-249-419-11	CARBON	1.5K	5%	1/4W
R508	△.1-247-688-11	CARBON	10	5%	1/4W F
R509	△.1-216-361-00	METAL OXIDE	0.22	5%	2W F
R510	△.1-216-361-00	(F220A)...METAL OXIDE	0.22	5%	2W
R511	△.1-247-688-11	CARBON	10	5%	1/4W F
R512	△.1-247-704-11	CARBON	220	5%	1/4W F

Ref.No.	Part No.	Description			
R513	1-247-723-11	(F120A)...CARBON	6.8K	5%	1/4W
R513	1-249-463-11	(F220A)...CARBON	27K	5%	1/4W
R514	1-247-727-11	CARBON	10	5%	1/2W
R515	1-249-465-11	CARBON	47K	5%	1/4W
R516	1-247-727-11	CARBON	10	5%	1/2W
R521	△.1-216-361-00	METAL OXIDE	0.22	5%	2W F
R522	△.1-216-361-00	(F220A)...METAL OXIDE	0.22	5%	2W
R601	1-247-713-11	CARBON	1K	5%	1/4W
R602	1-249-469-11	CARBON	100K	5%	1/4W
R603	1-247-712-11	(F120A)...CARBON	820	5%	1/4W
R603	1-247-711-11	(F220A)...CARBON	680	5%	1/4W
R604	1-249-496-11	CARBON	100K	5%	1/2W
R605	1-249-460-11	CARBON	15K	5%	1/4W
R606	1-249-423-11	CARBON	3.3K	5%	1/4W
R607	1-249-419-11	CARBON	1.5K	5%	1/4W
R608	△.1-247-688-11	CARBON	10	5%	1/4W F
R609	△.1-216-361-00	METAL OXIDE	0.22	5%	2W F
R610	△.1-216-361-00	(F220A)...METAL OXIDE	0.22	5%	2W
R611	△.1-247-688-11	CARBON	10	5%	1/4W F
R612	△.1-247-704-11	CARBON	220	5%	1/4W F
R613	1-247-723-11	(F120A)...CARBON	6.8K	5%	1/4W
R613	1-249-463-11	(F220A)...CARBON	27K	5%	1/4W
R614	1-247-727-11	CARBON	10	5%	1/2W
R615	1-249-466-11	CARBON	56K	5%	1/4W
R616	1-247-727-11	CARBON	10	5%	1/2W
R621	△.1-216-361-00	METAL OXIDE	0.22	5%	2W F
R622	△.1-216-361-00	(F220A)...METAL OXIDE	0.22	5%	2W
R701	1-247-723-11	(F120A)...CARBON	6.8K	5%	1/4W
R701	1-247-725-11	(F220A)...CARBON	10K	5%	1/4W
R702	1-249-437-11	CARBON	47K	5%	1/4W
R703	1-249-441-11	CARBON	100K	5%	1/4W
R704	1-249-439-11	CARBON	68K	5%	1/4W
R705	△.1-215-865-11	(F120A)...METAL OXIDE	220	5%	1W F
R705	△.1-216-430-11	(F220A)...METAL OXIDE	390	5%	1W
R706	1-247-725-11	(F120A)...CARBON	10K	5%	1/4W
R706	1-249-459-11	(F220A)...CARBON	12K	5%	1/4W
R708	1-249-419-11	CARBON	1.5K	5%	1/4W
R801	△.1-216-475-11	(F120A)...METAL OXIDE	120	5%	3W F
R801	△.1-215-913-11	(F220A)...METAL OXIDE	220	5%	3W
R802	△.1-215-915-11	(F120A)...METAL OXIDE	470	5%	3W F
R802	△.1-216-481-11	(F220A)...METAL OXIDE	1.2K	5%	3W

Note: The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description				
R803	△.1-249-451-11	CARBON	2.2	5%	1/4W	F
R804	△.1-249-451-11	CARBON	2.2	5%	1/4W	F
R805	1-247-713-11	CARBON	1K	5%	1/4W	
R806	1-247-713-11	CARBON	1K	5%	1/4W	
R807	1-249-455-11	CARBON	4.7	5%	1/4W	
R808	1-249-455-11	CARBON	4.7	5%	1/4W	
R901	1-247-706-11	(F120A)...CARBON	330	5%	1/4W	
R901	1-247-744-11	(F220A)...CARBON	270	5%	1/2W	
R902	1-247-706-11	(F120A)...CARBON	330	5%	1/4W	
R902	1-247-744-11	(F220A)...CARBON	270	5%	1/2W	
R907	1-249-412-11	CARBON	390	5%	1/4W	
R908	1-249-413-11	CARBON	470	5%	1/4W	
R909	1-249-413-11	CARBON	470	5%	1/4W	
R911	1-247-706-11	(F120A)...CARBON	330	5%	1/4W	
R911	1-247-744-11	(F220A)...CARBON	270	5%	1/2W	
R912	1-247-706-11	(F120A)...CARBON	330	5%	1/4W	
R912	1-247-744-11	(F220A)...CARBON	270	5%	1/2W	
RV301	1-238-513-11	RES, VAR, CARBON 150K/150K (BALANCE)				
RV302	1-238-514-11	RES, VAR 250K/250K (TONE:TREBLE)				
RV303	1-238-515-11	RES, VAR, CARBON 520K/520K (TONE:BASS)				
RV304	1-238-512-11	RES, VAR, CARBON 120K/120K (VOLUME)				
RV501	1-237-455-11	RES, ADJ, CARBON 500				
RV601	1-237-455-11	RES, ADJ, CARBON 500				
RY701	1-515-533-11	RELAY				
S1	△.1-554-920-21	SWITCH, PUSH (AC POWER)(1 KEY)(POWER)				
S301	1-571-871-11	(F220A)...SWITCH, ROTARY SLIDE (INPUT SELECTOR)				
S302	1-571-873-11	(F120A)... SWITCH, ROTARY SLIDE (INPUT SELECTOR)				
S302	1-571-873-11	(F220A)...SWITCH, ROTARY SLIDE (REC OUT SELECTOR)				
S303	1-571-828-11	SWITCH, PUSH (1 KEY)(SOURCE DIRECT)				
S304	1-571-872-11	SWITCH, PUSH (1 KEY) (F120A:TAPE/DAT MONITER,F220A:LOUDNESS)				
S821	1-571-309-31	SWITCH (SPEAKER IMPEDANCE SELECTOR)				
S901	1-571-870-11	SWITCH, ROTARY SLIDDE (SPEAKERS)				
T1	△.1-450-060-11	(F220A)...TRANSFORMER, POWER				
T1	△.1-450-061-11	(F120A)...TRANSFORMER, POWER				
TM901	1-537-227-11	TERMINAL BOARD (SPEAKERS A/B)				

ACCESSORY & PACKING MATERIAL

3-751-336-11	MANUAL, INSTRUCTION (ENGLISH,FRENCH,SPANISH,PORTUGUESE)
3-751-336-41	MANUAL, INSTRUCTION (GERMAN,DUTCH,SWEDISH,ITALIAN)
*4-929-260-01	CUSHION
*4-931-989-01	(F220A)...INDIVIDUAL CARTON
*4-931-990-01	(F120A)...INDIVIDUAL CARTON

Note: The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.